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ALTERATIONS IN LEFT VENTRICULAR REGIONAL MECHANICS IN PATIENTS WITH PULMONARY HYPERTENSION BY 3D ECHOCARDIOGRAPHIC STRAIN

Moderated Poster Contributions
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Authors: *Keiko Ryo, Tetsuari Onishi, Josef Marek, Mohamed Ahmed, Kristina Haugaa, Hunter Champion, John Gorcsan, University of Pittsburgh Medical Center, Pittsburgh, PA, USA*

Background: Although it is well known that chronic pulmonary hypertension (PAH) induces structural and functional right ventricular (RV) changes, its remote effects on regional left ventricular (LV) function are not well understood.

Methods: We studied 45 subjects: 25 with chronic PAH and 20 normal controls by the new approach of three-dimensional (3D) speckle tracking strain (Toshiba Corp.). We analyzed global LV area tracking strain and displacement and the septal and LV free wall strain separately. Routine echo parameters included eccentricity index and Doppler estimates of mean pulmonary artery pressure (mPAP).

Results: 3D area tracking strain revealed significant reductions in LV strain in PAH patients compared to normal controls (global -31.7 vs-42.7%, septum -29.2 vs -42.6%, LV free wall -33.4 vs -43.4%, all p<0.001). Time-to peak analysis revealed septal displacement to be significantly delayed compared to the LV free wall (p<0.001), and significantly different than normals (p<0.001). Eccentricity index was significantly greater in PAH patients (1.66 vs 1.04, p<0.01). Standard deviation of the time to peak 3D displacement correlated with mPAP (r=0.67, p<0.001) and eccentricity index (r=0.64, p<0.01).

Conclusions: 3D speckle tracking strain imaging in PAH patients quantified remote reductions in LV global and regional strain and dyssynchronous LV contraction that were associated with alterations in RV-LV geometry and pulmonary pressures.